1137-761

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of	**BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES**
Naohito TOMOE	
Serial No. 09/225,245	Appeal No.:
Filed: January 4, 1999	Examiner: Nguyen T. Vo
For: DEVICE FOR AND METHOD OF DETECTING INTERFERENCE WAVES	Group Art Unit: 2682
	October 16, 2001

BRIEF ON APPEAL

Assistant Commissioner for Patents
Washington, D.C. 20231

Dear Sir:

This is an appeal from the final rejection of claims 1, 2, 12 and 13 of the above-identified application, which claims were finally rejected in the Office action dated March 14, 2001. A Notice of Appeal was timely filed on July 16, 2001.

REAL PARTY IN INTEREST

The real party in interest in this case is Mitsubishi Denki Kabushiki Kaisha.

RELATED APPEALS AND INTERFERENCES

There are no other appeals or interferences which will directly affect or be directly affected by or have a bearing on the Board's decision in the present appeal.

STATUS OF THE CLAIMS

Claims 1-20 are pending in the application. Claims 10 and 11 stand allowed and claims 3-9 and 14-20 have been indicated to be directed to allowable subject matter. Claims 1, 2, 12 and 13 stand finally rejected. Claims 1 and 12 constitute the independent claims on appeal. This appeal is directed to claims 1, 2, 12 and 13.

STATUS OF AMENDMENTS

No proposed amendments after final rejection have filed in this application.

SUMMARY OF THE INVENTION

The present invention relates generally to the field of telecommunications, and in particular to radiotelephone communications systems which are subject to interfering radio waves ("interference waves") from sources other than transmitting units of the radiotelephone communication system, present in a particular region.

As well known in the art, radiotelephone communications systems utilize an infrastructure composed of a number of stationary base stations installed at various locations within a service region, where each base station serves a particular section of the service region. Users of the communications system utilize mobile communication devices, such as mobile

cellular telephones, which communicate with the base stations. The base stations in turn relay signals from the mobile telephone devices to other telephone users, either within the same mobile communication system via other base stations, or in other communication systems via telephone wire line connections through switching offices of the public switched telephone network (PSTN).

Interference waves, as their name indicates, are essentially noise to the radiotelephone communication system which may have a deleterious effect on the quality of voice and/or data communications being carried out by mobile device users within the system. Such waves may originate from different communication systems operating in the same region, or may be produced by various sources of electromagnetic interference that may be present in or near the radiotelephone communication system. Because the level of radio signals received by the system is not always constant, interference waves can reduce signal quality when the desired signal level is low. When such interference waves are present, it is necessary for the system to change the predetermined frequency of the communication signals to eliminate the interference.

According to the prior art, as shown in Fig. 11, a base station communicates with a mobile communication device via a transmitting/receiving antenna 4. Communication signals from the mobile device at a preselected frequency over an upward channel

are detected by a receiver 5. The base station transmits radio signals to the mobile device at another selected frequency over a downward channel from transmitter 2 to the antenna 4 (through branching circuit 3). The signal level of the received signal from the mobile unit is detected by a detector 6. A second antenna 8 receives signals having a certain frequency different from the signals received by the antenna 4, as determined by local oscillator 7 supplying a demodulation frequency to a second receiver 9. Those signals are detected by receiver 9 and the signal level of the detected signals are determined by second detector 10.

The signal levels from detectors 6 and 10 are inputted to a controller 12. If the level of the signal from antenna 8 is below an acceptable interference wave threshold, it is assumed that the level of potentially interfering waves at that frequency is low. Consequently the controller 12 determines that the certain frequency would be an acceptable frequency to switch over to if interference waves are detected on the upward channel being received at antenna 4.

If the level of the signal from antenna 8 is above the acceptable threshold level, the controller 12 changes the frequency being output by local oscillator 7 to change the frequency being received by receiver 9, to check the suitability of a different frequency for possible switching over in the event of interference on the current upward channel.

Subsequently, if the controller 12 determines that the level of the received signal from the mobile device on the upward channel as received by receiver 5 over antenna 4 falls below a threshold value, the controller 12 instructs the mobile device to switch its transmitting frequency over the upward channel to another frequency previously determined by controller 12 to be acceptable, as measured by receiver 9 and detector 10 from antenna 8.

While the prior art thus can improve the signal quality of an upward channel signal from a mobile device to a base station, it cannot correspondingly improve the signal quality of a signal transmitted by the base station to the mobile device over a downward channel. This is because the base station cannot detect the level of interference waves at the same frequency as the signal being transmitted by transmitter 2.

The present invention overcomes this deficiency by providing an interference wave detecting device capable of detecting the presence of interference waves that may interfere with signals being sent to a mobile device by a base station. According to the invention, as shown in Fig. 1, the transmission of a signal from the base station to a mobile device over a transmitting antenna 35 is temporarily stopped, while a signal is detected by receiver 40 from interference wave receiving antenna 39. This is necessary because receiving antenna 39 cannot independently detect an interference wave having the same frequency as a signal

being transmitted by the base station over antenna 35 at the same time that the signal was being transmitted over antenna 35. The stopping of transmission is timed to occur when both the time slot for the signal being transmitted to the mobile station from the base station and the time slot for the signal being transmitted to the base station from the mobile station are null.

The base station is thus able to detect the level of an interference wave having the same frequency or range of frequencies as the signal being transmitted by the base station to the mobile device or station. If the detected level indicates that the quality of the signal is being reduced to a less than acceptable level, the base station will change the transmitting frequency to a different frequency (previously determined to be acceptably free from interference) and instruct the mobile station as to the value of the new frequency. The operation of the invention is described at page 25, line 12, to page 31, line 26.

ISSUES

This appeal presents the following issue for decision by the Board:

Whether claims 1, 2, 12 and 13 are unpatentable under 35 U.S.C. § 103(a) over Yoshimi et al., U.S. Patent No. 5,603,093 ("Yoshimi") in view of the acknowledged prior art of Fig. 11 of the application, and are properly rejected on that basis.

GROUPING OF CLAIMS

Claims 1, 2, 12 and 13 stand or fall together and will not be separately argued in this appeal.

ARGUMENT

The Rejection of Claims 1, 2, 12 and 13 Is Improper

The Final Office action states that Yoshimi et al. discloses an interference device for detecting interference waves on a downlink channel from a base station to a mobile station, and that Fig. 11 of the present application discloses placing an interference wave detecting device at a base station, where the interference wave detecting device comprises transmitting and receiving means. Thus, according to the Examiner, it would have been obvious to dispose the detecting device of Yoshimi at a base station. The Examiner's rejection is improper and should be reversed.

The Examiner appears not to be aware of the law regarding a "teaching away" from a proposed combination of prior art references as an indicator of non-obviousness. In particular, a prior art reference should be considered as a whole, and portions arguing against or teaching away from the claimed invention must be considered. Bausch & Lomb, Inc. v. Barnes-Hind/Hydrocurve, Inc., 796 F.2d 443, 230 USPQ 416 (Fed. Cir. 1986). A reference may be said to teach away when a person of ordinary skill, upon reading the reference, would be led in a direction divergent from the path that was taken by the applicant. Tec-Air, Inc. v. Denso Manufacturing Michigan Inc., 192 F.3d 1353, 52 USPQ2d 1294 (Fed. Cir. 1999); In re Gurley, 27 F.3d 551, 31 USPQ2d 1130 (Fed. Cir. 1994).

In this case, Yoshimi at col. 1, lines 61-65 states that in a conventional system, in order to check the state of interference waves on radio channels of the same frequency in different zones, the transmission of radio waves from the base station of the zone to be checked had to be stopped. Such a system used a dedicated measurement device (col. 1, lines 66-67).

However, at col. 2, lines 12-21, Yoshimi explains that in such conventional system the transmission of a radio wave cannot frequently be stopped while the system is in service, and as a result a long amount of time was required to measure field intensities from other base stations. Yoshimi thus teaches away

from stopping base station radio wave transmission as a method of detecting interference waves, by proposing a method wherein a mobile station measures the field intensity and quality of a downlink radio wave from a base station and reports the measured results back to the base station at regular intervals.

The Examiner states that he is not relying on the invention of Yoshimi, but rather is relying only on the discussion of Yoshimi relating to the conventional system, as purported "evidence that there exists a teaching of stopping transmission of radio signal for the purpose of detecting an interference signal." See also Advisory action, Paper No. 8, at 2.

The Examiner's position would be correct if the Examiner were relying on Yoshimi as an anticipatory reference under 35 U.S.C. § 102, for in that case the concept of "teaching away" does not apply since no modification of the prior art would be required to arrive at the claimed invention. See Celeritas Technologies, Ltd. v. Rockwell, 150 F.3d 1354, 47 USPQ2d 1516 (Fed. Cir. 1998).

However, in this case the Examiner is not relying on Yoshimi under § 102, but instead proposes a combination of prior art references under an obviousness theory pursuant to 35 U.S.C. § 103. That is, the Examiner proposes to use the disclosure of Yoshimi as a teaching regarding the stopping of base station transmission in the proposed modification of the prior art to

supposedly arrive at the claimed invention. In such case, the prior art reference must be considered as a whole, and portions arguing against or teaching away from the claimed invention must be considered. Bausch & Lomb, supra. It is improper for the Examiner to ignore the teaching of the Yoshimi reference in favor of reliance only on its discussion of the "conventional system."

In the present case, Yoshimi teaches that a mobile station is to make measurements of the quality of a downlink radio wave from a base station and periodically report the results back to the base station, to eliminate the necessity of stopping base station transmission for the measurement to be taken by a dedicated measurement device as in the conventional system. Thus, it would not be obvious from Yoshimi to modify the prior art of Fig. 11 to have a base station receive an interference radio wave during a time that transmission of a radio signal by the base station is stopped, as alleged by the Examiner.

Further, while the Examiner alleges that Fig. 11 would be used to modify Yoshimi, it is not apparent how Yoshimi would be thus modified since the entire basis of the Yoshimi disclosure is to use a mobile station to measure interference waves.

The Examiner's assertion that the feature of detecting interference waves on the downlink channel from the base station to the mobile station is not present in the claims (see Advisory action, Paper No. 8, at 2) also is incorrect. Claim 1 sets forth

controlling means for causing the transmitting means (which transmits base station data as a radio signal to a mobile station) to stop transmitting the radio signal and to enable the receiving means to receive the interference wave signal. Thus, it is apparent that the interference signal so received is an interference signal from another base station. If the interference signal were a signal from a mobile station, there would be no need to stop transmission of the radio signal from the base station to measure it.

In any event, the Examiner's assertion is irrelevant to the determination of the obviousness of combining Yoshimi with the prior art of Fig. 11 as proposed in the Office action. The issue of obviousness is independent from what is recited in the claims of a patent application. Whether or not it would be obvious to combine references or to modify one reference in view of another depends upon the teachings of the references and the level of ordinary skill in the art, and does not depend on the scope or breadth of the claims of a patent application.

CONCLUSION

In view of the foregoing, claims 1, 2, 12 and 13 are submitted to be directed to a new and unobvious interference wave detecting method and apparatus which is not taught by the prior art. The Honorable Board is respectfully requested to reverse

all grounds of rejection and to direct the passage of this application to issue.

Please charge any fee or credit any overpayment pursuant to 37 CFR 1.16 or 1.17 to Deposit Account No. 02-2135.

Respectfully submitted,

ROTHWELL, FIGG, ERNST & MANBECK, p.c.

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APPENDIX OF CLAIMS ON APPEAL

1. An interference wave detecting device comprising:

transmitting means for converting data to be transmitted from a base station into a radio signal of a predetermined transmission frequency, and for transmitting said radio signal to a mobile station;

receiving means for receiving either of a radio signal lying within a certain reception band of frequencies including a predetermined reception frequency from said mobile station and an interference wave signal lying within a certain transmission band of frequencies including said predetermined transmission frequency; and

controlling means for causing said transmitting means to stop transmitting said radio signal of said predetermined transmission frequency in order to detect said interference wave signal, and for enabling said receiving means to receive said interference wave signal only within a period of time during which said transmitting means stops transmitting said radio signal of said predetermined transmission frequency to said mobile station.

2. The interference wave detecting device according to Claim 1, wherein when said receiving means has received and detected said interference wave signal having a frequency equal to said predetermined transmission frequency, said controlling means makes a request to change said predetermined transmission frequency to another transmission frequency, and wherein when said receiving means has received and detected said interference wave signal lying within said transmission band of frequencies, but having a frequency different from said predetermined transmission frequency, said controlling means furnishes a notify signal indicating the detection of the interference wave signal.

12. A method of detecting interference waves, comprising the steps of:

converting data to be transmitted from a base station into a radio signal of a predetermined transmission frequency, and transmitting said radio signal to a mobile station;

receiving a radio signal lying within a certain reception band of frequencies including a predetermined reception frequency from said mobile station; and

in order to detect an interference wave signal lying within a certain transmission band of frequencies including said predetermined transmission frequency, stopping the transmission of said radio signal of the predetermined transmission frequency to said mobile station and receiving said interference wave signal.

13. The interference wave detecting method according to Claim 12, further comprising the steps of, when said interference wave signal having a frequency equal to said predetermined transmission frequency has been detected, making a request to change said predetermined transmission frequency to another transmission frequency, and, when said interference wave signal lying within said transmission band of frequencies, but having a frequency different from said predetermined transmission frequency has been detected, furnishing a notify signal indicating the detection of the interference wave signal.

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TRANSMITTAL OF APPEAL BRIEF

Assistant Commissioner for Patents
Washington, D.C. 20231

Dear Sir:

Enclosed in connection with the above-referenced application is an Appeal Brief with Appendix in triplicate. A check is enclosed to cover the following fees: $430.00 to cover the fee for filing a brief in support of a notice of appeal ($320) and a one-month extension of time ($110).

Also, please charge any additional fees or credit any overpayment to Deposit Account No. 02-2135. A duplicate copy of this sheet is enclosed.

Respectfully submitted,

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